

## **CLAIMS**

What is claimed is:

1. A differential adjuster, comprising:  
  
an intermediate actuator sleeve with a first threaded surface, a second threaded surface, and a tool interface,  
  
wherein the first threaded surface contains threads that are a different pitch than the second threaded surface.
2. The differential adjuster of claim 1, further comprising a rotationally constrained push rod that engages the second threaded surface, the push rod moving at a rate related to the difference in pitch between the first threaded surface and the second threaded surface when the intermediate actuator sleeve is rotated relative to a housing that engages the first threaded surface by a tool that engages the tool interface of the intermediate actuator sleeve.
3. The differential adjuster of claim 2, wherein the housing and the push rod are arranged so that the push rod is rotationally constrained with respect to the housing.
4. The differential adjuster of claim 3, wherein a dowel pin engages both the housing and the push rod, thereby preventing the push rod from rotating with respect to the housing.
5. The differential adjuster of claim 1, wherein the first threaded surface is an external threaded surface and the second threaded surface is an internal threaded surface.

6. The differential adjuster of claim 1, wherein the first threaded surface and the second threaded surface are both external threaded surfaces.
7. The differential adjuster of claim 1, wherein the first threaded surface is an internal threaded surface and the second threaded surface is an external threaded surface.
8. The differential adjuster of claim 1, wherein the first threaded surface and the second threaded surface are both internal threaded surfaces.
9. The differential adjuster of claim 2, wherein the housing is a main body.
10. The differential adjuster of claim 9, wherein the main body is less than about 1 inch in length.
11. The differential adjuster of claim 10, wherein the main body includes a main body tool interface for allowing a second tool to rotate the main body.
12. The differential adjuster of claim 10, wherein the main body includes a threaded surface.
13. The differential adjuster of claim 12, wherein the main body can engage a mount threaded surface in a component mount.
14. The differential adjuster of claim 13, wherein the main body threaded surface provides a coarse adjustment.
15. The differential adjuster of claim 14, wherein the main body is less than about 1 inch in length.
16. The differential adjuster of claim 15, wherein the main body is less than about 0.25 inch in diameter.

17. The differential adjuster of claim 14, further comprising a knob coupled to the main body to provide a coarse adjustment, the knob defining an opening allowing access to the tool interface.

18. The differential adjuster of claim 14, wherein the main body includes a coarse tool interface to affect the coarse adjustment.

19. The differential adjuster of claim 18, wherein the coarse tool interface accommodates a coarse adjustment tool, the coarse adjustment tool chosen from the group consisting of a spanner wrench, a socket, a screw driver, a ball driver, and an allen wrench.

20. The differential adjuster of claim 19, wherein the coarse adjustment tool includes a knob or handle.

21. The differential adjuster of claim 19, wherein the coarse adjustment tool includes a motor.

22. The differential adjuster of claim 1, wherein the tool interface accommodates a differential adjustment tool, the differential adjustment tool chosen from the group consisting of a screw driver, a ball driver, and an Allen wrench.

23. The differential adjuster of claim 22, wherein the differential adjustment tool includes a knob or handle.

24. The differential adjuster of claim 22, wherein the differential adjustment tool includes a motor.

25. The differential adjuster of claim 2, wherein the housing is a component mount or positioner that engages the first threaded surface of the intermediate actuator sleeve.

26. The differential adjuster of claim 2, wherein the push rod includes a ball bearing.

27. A differential adjuster, comprising:

an intermediate actuator sleeve including a first threaded surface and a second threaded surface of different pitch;

a main body engaged with the first threaded surface of the intermediate actuator sleeve, the main body including a threaded surface to provide a coarse adjustment; and

a push-rod engaged with the second threaded surface of the intermediate actuator sleeve and coupled to the main body to restrict the relative rotational motion between the push-rod and the main body,

wherein the main body includes a coarse tool interface.

28. The differential adjuster of claim 27, wherein a dowel pin engages both the main body and the push rod, thereby constraining the push rod from rotating with respect to the main body.

29. The differential adjuster of claim 27, wherein the first threaded surface of the intermediate adjuster sleeve is an external threaded surface and the second threaded surface of the intermediate adjuster sleeve is an internal threaded surface.

30. The differential adjuster of claim 27, wherein the first threaded surface of the intermediate adjuster sleeve and the second threaded surface of the intermediate adjuster sleeve are both external threaded surfaces.

31. The differential adjuster of claim 27, wherein the first threaded surface of the intermediate adjuster sleeve is an internal threaded surface and the second threaded surface of the intermediate adjuster sleeve is an external threaded surface.

32. The differential adjuster of claim 27, wherein the first threaded surface of the intermediate adjuster sleeve and the second threaded surface of the intermediate adjuster sleeve are both internal threaded surfaces.

33. The differential adjuster of claim 27, wherein the main body is less than about 1 inch in length.

34. The differential adjuster of claim 33, wherein the main body is less than about 0.25 inch in diameter.

35. The differential adjuster of claim 27, wherein the threaded surface of the main body can engage threads in a component mount or positioning device device.

36. The differential adjuster of claim 27, wherein the coarse tool interface accommodates a coarse adjustment tool, the coarse adjustment tool chosen from the group consisting of a spanner wrench, a socket, a screw driver, a ball driver, and an allen wrench.

37. The differential adjuster of claim 36, wherein the coarse adjustment tool includes a knob or handle.

38. The differential adjuster of claim 36, wherein the coarse adjustment tool includes a motor.

39. The differential adjuster of claim 27, wherein the intermediate actuator sleeve is coupled to a knob to affect a differential adjustment.

40. The differential adjuster of claim 27, wherein the coarse tool interface accommodates a spanner wrench.

41. The differential adjuster of claim 27, wherein the intermediate actuator sleeve includes a tool interface.

42. The differential adjuster of claim 41, wherein the tool interface of the intermediate actuator sleeve accommodates an adjustment tool, the adjustment tool chosen from the group consisting of a spanner wrench, a socket, a screw driver, a ball driver, and an Allen wrench.

43. The differential adjuster of claim 42, wherein the differential adjustment tool includes a knob or handle.

44. The differential adjuster of claim 42, wherein the differential adjustment tool includes a motor.

45. A mounting device, comprising:

a device housing with a component mount to accommodate at least one component; and

at least one differential adjuster coupled to the device housing in order to adjust a positioning of the component mount,

wherein the at least one differential adjuster comprises:

an intermediate actuator sleeve with a first threaded surface, a second threaded surface and a tool interface, wherein the first threaded surface has threads that are a different pitch than those of the second threaded surface;

a push rod that engages the second threaded surface and couples with the component mount.

46. The mounting device of claim 45, wherein the device housing engages the first threaded surface of the intermediate actuator sleeve of the device housing and wherein the push rod is rotationally constrained with respect to the device housing.

47. The mounting device of claim 45, wherein the at least one differential adjuster further includes a main body that engages the first threaded surface of the intermediate actuator sleeve, the main body being coupled to the device housing, wherein the main body engages the push rod such that the push rod is rotationally constrained with respect to the main body.

48. The mounting device of claim 47, wherein the main body includes a main body threaded surface that engages with threads of the device housing.

49. The mounting device of claim 48, wherein the main body includes a knob in order to affect coarse adjustment of the component mount.

50. The mounting device of claim 48, wherein the main body includes a main body tool interface.

51. The mounting device of claim 50, wherein the main body tool interface accommodates a main body adjustment tool, the main body adjustment tool chosen from a group consisting of a spanner wrench, a socket, a screw driver, a ball driver, and an Allen wrench.

52. The mounting device of claim 51, wherein the main body adjustment tool includes a knob or handle.

53. The mounting device of claim 51, wherein the main body adjustment tool includes a motor.

54. The mounting device of claim 45, wherein the tool interface accommodates a differential adjustment tool, the differential adjustment tool chosen from a group consisting of a spanner wrench, a socket, a screw driver, a ball driver, and an Allen wrench.

55. The mounting device of claim 54, wherein the differential adjustment tool includes a knob.

56. The mounting device of claim 45, wherein the component mount accommodates an optical component.

57. The mounting device of claim 56, wherein the optical component includes a mirror, a lens, an optical fiber, or an optical filter.

58. The mounting device of claim 45, wherein the component mount accommodates a sample for testing.

59. The mounting device of claim 58, wherein the component mount is a translation stage.



60. A mounting device, comprising:

a device housing with a component mount to accommodate at least one component; and

at least one differential adjuster coupled to the device housing in order to adjust a positioning of the component mount,

wherein the at least one differential adjuster comprises:

an intermediate actuator sleeve with a first threaded surface and a second threaded surface, wherein the first threaded surface has threads that are a different pitch than those of the second threaded surface;

a push rod that engages the second threaded surface and couples with the component mount; and

a main body that engages the first threaded surface and the push rod such that the push rod is rotationally constrained with respect to the main body.

61. The mounting device of claim 60, wherein the intermediate actuator sleeve includes a knob in order to affect fine adjustment of the component mount.

62. The mounting device of claim 60, wherein the intermediate actuator sleeve includes a tool interface in order to affect fine adjustment of the component mount.

63. The mounting device of claim 62, wherein the tool interface accommodates an adjustment tool, the adjustment tool chosen from a group consisting of a spanner wrench, a socket, a screw driver, a ball driver, and an Allen wrench.

64. The mounting device of claim 63, wherein the adjustment tool includes a knob or handle.

65. The mounting device of claim 63, wherein the adjustment tool includes a motor.

66. The mounting device of claim 60, wherein the main body tool interface accommodates a main body adjustment tool, the main body adjustment tool chosen from a group consisting of a spanner wrench, a socket, a screw driver, a ball driver, and an Allen wrench.

67. The mounting device of claim 66, wherein the main body adjustment tool includes a knob.

68. The mounting device of claim 60, wherein the component mount accommodates an optical component.

69. The mounting device of claim 68, wherein the optical component includes a mirror, a lens, or a filter.

70. The mounting device of claim 60, wherein the component mount accommodates a sample for testing.

71. The mounting device of claim 70, wherein the component mount is a translation stage.

72. A differential adjuster, comprising:

means for differential adjusting; and

means for activating the means for differential adjusting with a tool.

73. The differential adjuster of claim 72, further including means for performing a coarse adjustment.

74. A method for moving a component, comprising:

turning a main body in a housing to affect a coarse adjustment; and

turning an intermediate actuator sleeve, the intermediate actuator sleeve including a first threaded surface engaged with the main body and a second threaded surface engaged with a push rod that is rotationally constrained and that is engaged with the component,

wherein an adjustment tool is utilized.

75. The method of claim 74, wherein the adjustment tool is utilized in turning the main body.

76. The method of claim 74, wherein the adjustment tool is utilized in turning the intermediate actuator sleeve.